King County EMS

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CBT 433 Abdominal Pain

Course Supplement

Intro

The patient with acute abdominal pain is often problematic for the BLS provider, given the difficulty of determining the cause of such pain. Diagnosing the cause of abdominal pain is difficult even for experienced physicians. Proceed with the call, like any other. First, you need to make an initial decision of SICK or NOT SICK and begin appropriate treatment. As your assessment proceeds and the patient's ABC-related needs are met, collect the subjective and objective information as always.

Keep in mind that an EMT's assessment goal in the case of acute abdomen is to determine the quality and location of the pain and if there are abnormalities in the abdomen itself.

Resources

The recertification exam for this module is based on a variety of resources. We recommend that you review the following:

> Chapter 14 – Acute Abdomen - *Emergency Care and Transportation of the SICK and Injured*, 8th ed.)
>
> King County EMS *Patient Care Guidelines for BLS* (10/02 ed.) pages 1.4 (Postural Blood Pressure) and 2.31-2.32.

This course also has a hands-on practical skills component.

Objectives

CBT 433 is an EMT continuing education and recertification course. After completing this course you will be able to:

1. Identify the location and function of anatomical structures in the abdomen.
2. Identify the types of pain that the human body experiences.
3. Describe some common causes of abdominal pain…
4. Describe how to examine the abdomen and inspect and palpate signs and symptoms of injury
5. Identify the correct steps in performing a postural vital signs check.
6. Identify the proper emergency medical care for a patient with abdominal pain.

Terms

cholecystitis – Inflammation of the gall bladder.

etiology – The cause or origin of a disease or disorder as determined by medical diagnosis.

fallopian tube – Hollow tube that transports the ovum (female egg) from the ovary to the uterus.

hematemesis – Vomiting of blood (hema = blood + emesis = vomit).

hematochezia – The passage of bloody stools.

hernia – Protrusion of an organ or tissue through an opening in its surrounding walls, especially in the abdominal region.

melena – Abnormal, black, tarry stools caused by gastrointestinal (GI) bleeding. Melena is usually caused by upper GI bleeding since digested blood is dark and tarry in character.

mesentery – The mesentery is a double fold of the peritoneum that supports the major portion of the small bowel, suspending it from the posterior abdominal wall.

orthostatic hypotension – A sudden fall in blood pressure that occurs when a person sits or stands up.

peritoneum – A membranous sac that lines the abdominal cavity

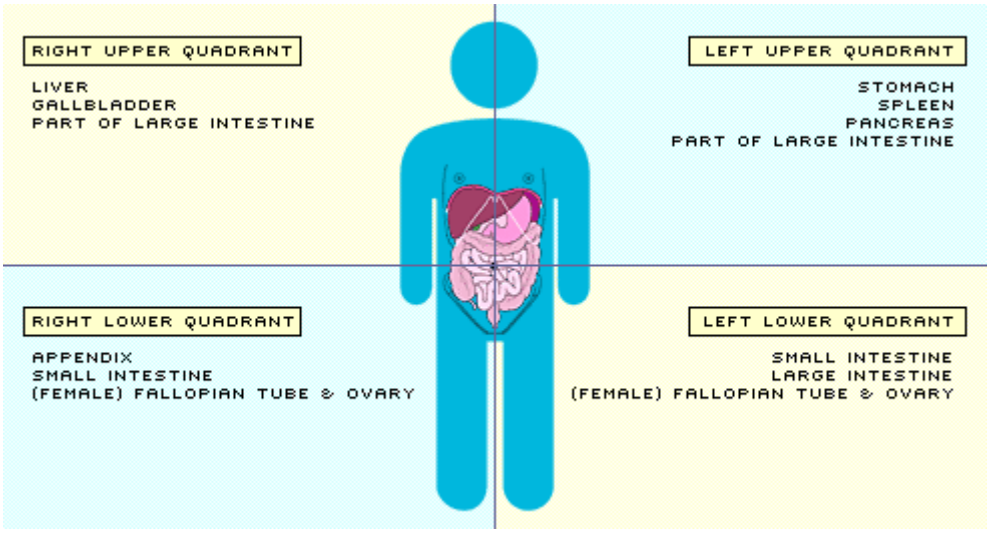
retroperitoneum – This is the area directly behind the peritoneum

vagus nerve – The vagus nerve is the primary nerve of the parasympathetic nervous system

varices – Varices are dilated veins

Anatomy

The abdomen is the largest cavity in the body. It is separated from the chest cavity by the diaphragm. Most of the abdominal organs are enclosed within a membrane called the peritoneum. Those organs behind and outside the peritoneum are retroperitoneal and include the kidneys, pancreas and the abdominal aorta.



The abdomen has four quadrants:

- Right upper
  Liver, gallbladder and part of the large intestine
- Left upper
  Stomach, spleen, pancreas and part of the large intestine
- Right lower
  Appendix, small intestine, (female) fallopian tube and ovary
- Left lower
  Small and large intestine, (female) fallopian tube and ovary

Types of Pain

When considering the cause of abdominal pain, it is helpful to characterize the type of pain the patient is experiencing. The three categories of pain commonly associated with the acute abdomen are visceral, somatic and referred.

Visceral pain**,** or diffuse pain, is the result of stimulation of nerve fibers of organs. This pain is described as crampy, colicky (comes and goes) or gassy. It tends to be diffuse and difficult for the patient to pinpoint. This pain is commonly associated with sweats, vomiting, nausea and tachycardia.

Stimulation of the visceral pain pathways often stimulates the vagus nerve causing a vagal reaction (parasympathetic) with vasodilatation (decreased BP), bradycardia, sweating, nausea and vomiting. Sometimes vagal responses result in profound hypotension, syncope and often--serious symptoms.

In general, vagal responses may be reversed through a combination of supine position and elevation of the legs. If this BLS level of care does not alleviate the symptoms request a paramedic unit.

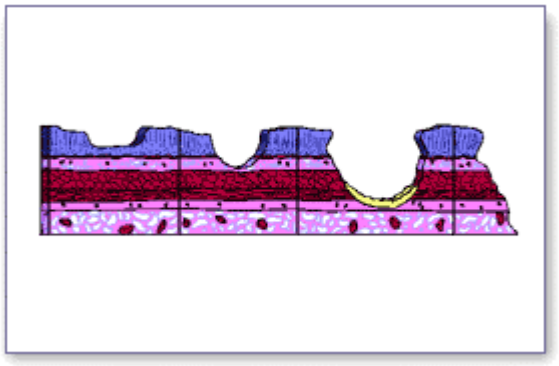
Somatic pain, also known as focal pain, occurs when nerve fibers within the peritoneum are irritated by chemical or bacterial inflammation. Somatic pain is more localized and is usually described as sharp and knifelike. It is constant and made worse by coughing and movement.

Referred pain, or radiating pain, is any pain that is felt at a location away from the point of origin. For example, the pain associated with kidney stones may be referred to the testicle.

Etiology and Pathophysiology

Peptic Ulcer
A peptic ulcer is an erosion of the lining of the stomach, duodenum or esophagus. It frequently causes upper abdominal pain.

Patients with peptic ulcers may use antacids or other acid blocking drugs such as Tagamet, Zantac and Prilosec. They often have prescriptions for antibiotics to control peptic ulcer disease and reflux esophagitis.



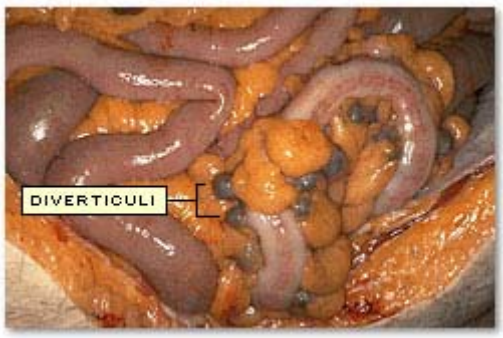
Ulcerated Stomach Lining

Peptic ulcer disease typically begins in males between the ages of 34-45. The patient may complain of chronic, vague pain in the epigastrium or LUQ. The pain may be described as steady, dull, or burning and is usually relieved by taking antacids. Symptoms often begin in the early morning when the stomach is empty.

Be alert for signs of shock. If the patient has a slow internal hemorrhage, he or she may show signs of anemia (pale and weak).

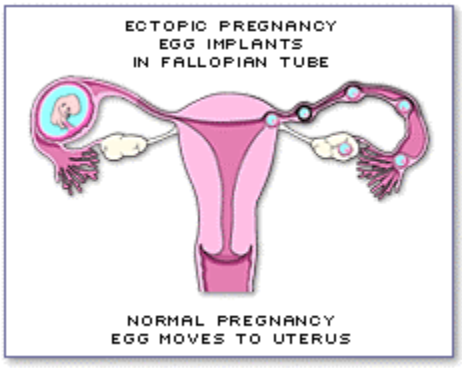
Diverticulitis
A diverticulum is a sac that develops in the wall of the large intestine. Diverticulitis occurs when the diverticulas become inflamed and infected. Occasionally, the sac will rupture, bleed or cause obstruction and lead to abdominal pain.

Because this is a common source of inflammation, the patient may be able to provide a history of flair-ups. Most people over the age of 50 have diverticulas.



Ruptured Ectopic Pregnancy
Ectopic pregnancy occurs in females of childbearing years (12-50). An ectopic pregnancy is a fetal implantation that occurs outside the uterus, most typically in the fallopian tube. In a fallopian implantation, a rupture can occur if the fetus continues to grow, usually between 2-12 weeks.

Ectopic pregnancy accounts for 11% of all maternal deaths and should be considered in females of childbearing years with lower abdominal pain.



The patient may complain of severe RLQ or LLQ unilateral abdominal pain and may be described as cramping and radiating to the right or left shoulder. (An example of referred pain)

Ask about missed or irregular menstrual cycles and spotting.

The patient may have history of ectopic pregnancy. As well, she may have a history of pelvic inflammatory disease (PID).

Ruptured Abdominal Aortic Aneurysm (AAA)
An aneurysm is a weakening and dilation of the wall of an artery. The most common site of AAA is below the renal arteries and above the aortic bifurcation (just behind the umbilicus). When the artery becomes weak it can become enlarged and balloon out and rupture resulting in significant blood loss. This condition requires immediate surgical intervention. As many as 2 of 3 patients with ruptured AAA die before arriving at the hospital (Thomas, 1998).

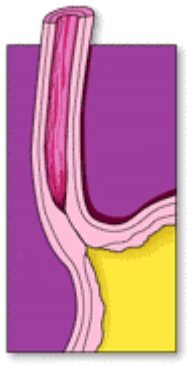
The “classic” AAA patient complains of severe abdominal pain or lower back pain, sometimes described as ripping or tearing and radiating to the groin. This is an example of referred pain.

Remember that the abdominal aorta travels down the middle of the abdomen, so on a skinny person you may feel pulsations of the aorta which is perfectly normal. If a mass is found, and it often isn’t, it is usually superior to the umbilicus, left of mid-line.

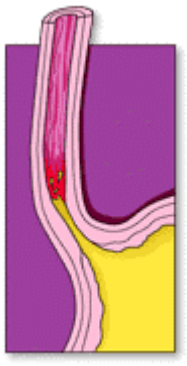
Check femoral pulses and leg temperature for equality if a AAA is suspected.

Esophagitis
Esophagitis is the inflammation of the lower esophagus, usually caused by acid that regurgitates due to a weak cardiac sphincter (the gate between the lower esophagus and stomach). It is often associated with peptic ulcer disease.

The patient with esophagitis may be aware of this disease often called hiatal hernia or ***esophageal reflux***. Symptoms may mimic those of ischemic cardiac pain (MI and angina).



Normal esophageal sphincter



Ineffective esophageal sphincter allows reflux

The pain associated with esophagitis is commonly felt as a burning substernal chest pain that increases when the patient lies down and can be relieved with antacids and cool liquids. The patient may also describe a bitter or foul taste in the mouth. People with a history of this disease often take antacid medications like Pepcid, Zantac, Prilosec and Axid.

Intestinal Flu

Intestinal flu may cause abdominal pain with cramping, nausea, vomiting, malaise and diarrhea. There may be a recent history of exposure to other people with similar symptoms. Intestinal flu is usually self-limiting but may need treatment for the symptoms of nausea, vomiting and diarrhea.

Food Poisoning

Food poisoning may be caused by many different bacteria and toxins. A common form of food poisoning is staphylococcal food poisoning. In this type of illness, the patient usually presents with an abrupt onset of severe nausea, cramps, vomiting, and sometimes diarrhea. Typically the suspect food was ingested up to six hours prior to onset of the symptoms. Ask about the symptoms of others who may have eaten the same food. This ailment is usually self-limiting but the patient may need treatment for nausea, vomiting and dehydration.

Ruptured Appendicitis

The appendix is a small pouch off the ***cecum*** of the large intestine. Often the pouch becomes impacted with feces and becomes inflamed. If inflammation continues the sac may rupture into the peritoneum and cause peritonitis and septic shock.

Classic signs and symptoms include low-grade fever with periumbilical pain (pain around the belly-button) and loss of appetite. It often occurs in younger people and presents as vague abdominal symptoms progressing to well localized pain and tenderness in the RLQ (right lower quadrant).

Appendix normal

On physical exam, the patient usually complains of severe RLQ pain with abdominal guarding (involuntary tightening of abdominal muscles). If rupture occurs, the RLQ pain is temporarily resolved before generalized peritonitis and diffuse pain begins.

Pancreatitis
Pancreatitis is inflammation of the pancreas. Patients with a history of alchohol abuse have a high risk of developing this disease. The pain of pancreatitis is often excruciating.

The patient may be found in a fetal position, writhing in pain. The pain is sometimes felt epigastric or mid-umbilicus radiating to the back or shoulders. ***Gallstones*** and alcoholism are often associated with pancreatitis.

Cholecystitis
Cholecystitis is inflammation of the gall bladder. 75% of the time it is associated with gallstones. It is a very common disease. Remember the “classic” cholecystitis patient by the 4 Fs mnemonic: overweight (fat), fertile, female in her forties. The actual age range is from 30 to 50 years.

This pain is classically felt in the epigastrium radiating to the RUQ and right shoulder. Ingestion of fatty foods may initiate the symptoms. The patient may also complain of fever and vomit bile.

A classic physical finding is called ***Murphy’s sign*** that is found by placing the patient semi-Fowler’s position and palpating the RUQ. (The liver and gall bladder are easier to locate during inspiration.) Murphy’s sign is present if the patient’s ability to inspire air is restricted by severe pain.

Obstruction
Intestinal obstruction is a blockage anywhere along the path of the small or large intestines. There are numerous causes such as adhesions (scar tissue), strangulated hernia, impaction, cancer and chronic inflammation.

Someone with a bowel obstruction will complain of nausea and vomiting (the most common cause of vomiting fecal material) that can lead to dehydration, abdominal pain, constipation and abdominal distension. These patients are at risk of perforation and/or bowel strangulation, which quickly lead to peritonitis and septic shock.

Urinary Tract Infections
Inflammation of the urinary tract can occur anywhere along the route from the kidneys to the bladder. Urinary tract infections (UTIs) are more common in women due of the short distance between the female urethra and the bladder.

Urinary tract infections may present with pain in the suprapubic region. Other symptoms may include pain on urination, the need to urinate frequently, blood in the urine, fever and chills.

Kidney Stones
Kidney stones are common among men between the ages of 30 - 50. It is estimated that 12% of the population in the U.S. suffers this painful disease.

The pain associated with a kidney stone can be impressive. The patient usually complains of flank pain that initially comes and goes, then progresses to steady misery. The pain may travel to the RLQ or LLQ or groin and is sometimes associated with low-grade fever, nausea and vomiting. One of the hallmark observations is a patient who is restlessly attempting to find a position of comfort to no avail.

A patient with kidney stones will often show signs of a sympathetic response: pale, cool and diaphoretic. Many patients have a past history of similar episodes.

Inflammation and Bleeding

Inflammation as an etiology of abdominal pain is seldom life threatening unless the patient becomes septic and shows signs of septic shock. Every organ in the abdomen can be the site of inflammation and pain. Some of the more common afflictions include:

- Esophagitis
- Appendicitis
- Pancreatitis
- Cholecystitis
- Diverticulitis
- Nephritis
- Cystitis

In addition, kidney stones, MI, pneumonia and musculo-skeletal pain may have pain referred to the abdominal area.

Bleeding may accompany abdominal pain. Clues that suggest internal bleeding include a history of:

- Vomiting blood (hematemesis)
  -the blood can be bright red blood or have the appearance of coffee grounds.
- The passage of bright red blood (hematochezia) or dark-tarry stools (melena) and associated signs of shock

Sources of abdominal bleeding include:

- Peptic ulcer disease
- Esophageal varices (dilated veins)
- Colonic diverticuli
- Colon cancer
- Ruptured ectopic pregnancy
- Abdominal aortic aneurysm

Focused History (Subjective)

A good history begins when you walk on the scene and observe the surroundings. Look at the patient before speaking. You may see enough indicators to decide SICK or NOT SICK at this point. If you choose the SICK category, move quickly to treatment—if not, place the patient in the NOT SICK category, start initial care and take additional time to complete the assessment. Determine the chief complaint once you have established rapport with the patient.

Some questions you may ask in the OPQRST assessment of the chief complaint include:

Onset	Where is the pain and when did it begin? What were you doing when it started? Did the pain come suddenly or gradually?
Provocation	Does the pain move around? Is the pain related to any bodily function such as eating, bowels, position, or exertion? Does anything lessen the pain?
Quality	Can you describe the pain? Does it come and go? Is it constant? Is it sharp, dull or burning?
Radiation	Where do you feel it and where does it go?
Severity	How severe is the pain on a scale of 1-10 scale
Time	What time did the pain come on?

You are not expected to determine the cause of a particular pain. You are expected to describe the character of a patient's pain as outlined in the OPQRST mnemonic.

SAMPLE is a mnemonic for the questions to ask when conducting a focused medical history. It organizes the information you gather from the patient or bystanders in a logical format.

Symptoms	Chief complaint What happened? Specific circumstances surrounding the chief complaint MOI/NOI
Allergies	Including those particular to any medications

Medications	Prescription drugs Over the counter drugs Recreational (illicit) drugs
Past history	Medical conditions (hemophilia, etc…)
Last oral intake	Food and drink
Events leading up to the incident	Precipitating factors (e.g. eating, activity)

When collecting information about past medical history consider asking about ***hematemesis*** and ***hematochezia***. Remember, it only takes 60cc of blood to produce ***melena***—a relatively small amount. This finding by itself does not automatically mean that the patient is SICK.

Physical Exam (Objective)

At all times during your encounter with an abdominal pain patient you will need to be alert for signs of hypotension. Remember that both hemorrhagic and septic shock are commonly associated with acute abdomen. Look for the following signs of shock:

- Restlessness
- Rapid pulse **
- Slow capillary refill (greater than 2 seconds) ***
- Tachypnea
- Skin - warm to hot, often feverish and dry (look for this in early stages)
- Cool, clammy skin
- Pale skin in a warm environment
- Hypotension

**A rapid pulse may not be present in patients taking medications that slow the heart rate such as beta blockers and calcium channel blockers.
*** Be sure to check capillary refill when in a warm environment

Limit your physical exam to inspection and palpation only. Do not perform auscultation of the bowels.

Abdominal Exam
Palpate the area after eliciting the location of the pain. Do not immediately push on the affected area but work over to it by checking the unaffected quadrants first. The patient is likely in a lot of pain already, so palpate gently. Note tightening of the muscles to reduce pain (guarding).

The patient must be in a supine position in order to perform a proper and effective abdominal exam. Do not do this exam on a sitting patient.

Once the location of the pain is found, do not continue to “mash down” on the abdomen. This causes unnecessary pain for the patient and provides you with no more information. Inspect for distension, abdominal surgery scars, skin color and the patient’s position (e.g., knees drawn up).

Postural Vital Signs

Orthostatic hypotension is a sudden fall in blood pressure that occurs when a person moves to an upright position. It is generally related to hypovolemia and caused by blood loss, diuretics, vasodilators or dehydration.

To assess for orthostatic hypotension you should perform a postural vital signs check. Consider performing this check in patients who complain of abdominal pain with associated light-headedness or with the possibility of volume depletion including:

- Suspected GI bleeding or internal hemorrhage
- Generalized weakness
- Dizziness, light-headedness or fainting
- Prolonged vomiting or diarrhea

Contraindications for checking postural vitals signs includes:

- Hypotension while supine (BP less than 90 mm Hg)
- Third trimester bleeding
- Trauma patients

Perform these steps to check postural vital signs:

1. Place the patient in a **supine position** for 2 minutes and record his or her blood pressure and heart rate.

2. Place the patient in a **sitting position** with the feet dangling for 1 minute and record his or her blood pressure and heart rate.

3. If the test does not show positive findings in the sitting position, help the patient to a **standing position** for 1 minute and record his or her blood pressure and heart rate.

> If fainting or light-headedness worsens at any time, immediately return the patient to a supine position.

Positive findings include any one or more of the following:

- **Systolic BP** decreases **30 mm Hg** or more from supine to sitting or standing
- Systolic blood pressure of less than **90 mm Hg** while sitting or standing
- **Severe light-headedness** or syncope during the postural vital signs exam

A positive finding for postural vital signs = ALS response

Assessment

It is very difficult to pinpoint the cause of illness for abdominal pain and highly likely that you will spend a lot of time gathering patient information and still not have a clue as to what is wrong with the patient.

In the face of vague or unclear symptoms or complaints, you should look at the clinical indicators (respirations, pulse, mental status, skin color, body position), chief complaint, MOI/NOI and your index of suspicion and decide SICK or NOT SICK. Your treatment should be appropriate to the patient's overall condition. For example:

> *Your patient is a 42-year-old male, complaining of LLQ pain with history of nausea and vomiting for the last 24 hours. RR = 16, HR = 80, patient is alert and oriented to person, place and time. Skin is warm and dry. You choose the NOT SICK category and begin oxygen therapy at 4 LPM by nasal cannula and proceed to get a more detailed focused history. BP 126/78.*

For this case your SOAP assessment is:

- 42-year-old male, LLQ pain with nausea and vomiting

Here's another example:

> *Your patient is a 23-year-old female, severe LLQ. RR = 24, HR = 118, patient is alert and oriented to person, place and time. Skin is pale, cool and dry. She states that it is possible that she is pregnant. You have decided to place her in the SICK category and have begun aggressive BLS care with high flow oxygen flow (10-12 LPM) via NRB, confirmed medic response, treated for shock and prepared for transport. BP 126/60.*

For this case your SOAP assessment is:

- 23-year-old female, severe LLQ pain, possible pregnancy-related illness

The SOAP assessment for abdominal complaints can simply be a description of pain and location. You do not need to know whether the problem is gastritis, pancreatitis or cholecystitis in order to decide whether the patient is SICK or NOT SICK and offer appropriate care.

Although BLS providers are not expected to make a diagnosis of abdominal pain, it is helpful to sometimes know particular ailments that occur in different regions of the abdomen. Knowing these may improve your awareness of potentially life-threatening situations and improve your SICK NOT SICK decision-making. Below is a summary.

Epigastric Pain

- Gastritis
- Esophagitis
- Pancreatitis
- Cholecystitis
- Acute myocardial infarction (AMI)

Right Upper Quadrant (RUQ)

- Cholecystitis
- Hepatitis
- Perforated ulcer
- Renal pain right side

Left Upper Quadrant (LUQ)

- Pancreatitis
- Gastritis
- Renal pain left side
- Splenic rupture/Infarct

Right Lower Quadrant (RLQ)

- Appendicitis
- Abdominal aortic aneurysm (AAA)
- Ectopic pregnancy
- Ovarian cyst
- Pelvic inflammatory disease (PID)
- Kidney stone
- Strangulated hernia
- Intestinal obstruction
- Generalized peritonitis

Left Lower Quadrant (LLQ)

- Obstruction secondary to cancer
- Diverticulitis
- Abdominal aortic aneurysm (AAA)
- Ectopic pregnancy
- Ovarian cyst
- Pelvic inflammatory disease (PID)
- Kidney stone
- Hernia
- Intestinal obstruction
- Generalized peritonitis

Treatment (Plan)

Your treatment plan should be consistent with the clinical presentation of the patient. For example, if you decide the patient is SICK, then the plan should reflect appropriate care for a SICK patient like immediate transport, high flow oxygen, treatment for shock, confirm medic unit is en route, etc.

Your care for a patient with abdominal pain may include:

- Airway, breathing and circulation
- Medic unit
- Reassurance
- Oxygen according to the patient's need
- Nothing by mouth
- Appropriate position
- Treat for shock
- Transport to appropriate medical facility